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Crop Watch No. 00-11, May 26, 2000

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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 00-11
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Despite recent rain, drought worsens

Throughout much of Nebraska rows of early emerging crops look good, but camouflage what's under the surface — hard soils and extremely limited moisture at most depths. Agriculture's dire need for precipitation and the ramifications of the developing drought throughout the state were among the issues discussed this week when government and University leaders met with the governor to continue the drought response plan.

Since last September, the northeast, central, east central, south central, and southeast climatic districts received above normal precipitation only in February. The southwest district received above normal precipitation in February and March, and the north central district received above normal precipitation in September, February, and May.

A storm system late last week brought welcome precipitation and limited relief to north central and northeast Nebraska, often with 2-4 inches of rain. Unfortunately, the rains fell over several hours instead of several days, resulting in runoff.

Inside

In southern Nebraska rainfall was spotty at best, with most locations south of I-80 receiving less than 0.25 inch. Soil moisture conditions continue to deteriorate. From April 1 to May 19 precipitation has been less than 40% of normal for portions of southwest, south central, and southeast Nebraska. This has more than offset the above normal precipitation in February and the first half of March (*see table, page 91*).

The Panhandle has been the one bright spot during this ongoing drought. Precipitation across the northern Panhandle has averaged 150-200% of normal during the last nine months, with the southern Panhandle receiving 100-125% of normal precipitation. Above normal conditions also extend into the western third of the north central district.

The pattern of below normal precipitation is particularly dramatic across the eastern third of Nebraska. Since last September, precipitation in the east central and southeastern climatic districts was less than 50% of normal. Even with the recent rains in the northeast district, precipitation levels are still more than six inches below normal.

In historical terms, we have now entered the 2000 production season in worse condition than at the onset of the 1988 and 1989 drought years. Drought during those two years mainly resulted from a lack of growing season precipitation.

Even with the recent rainfall, 90% of the area east of the Panhandle has been identified as being in a severe drought, according to the U.S. Drought Monitor. Within the severe drought area, portions of Gage, Johnson, Lancaster, Nemaha, Otoe, Pawnee, and Richardson counties have now met the criteria necessary to be placed in the extreme drought category. (This classification requires that September, January, and April to date precipitation be less than 50% of normal.) In addition,

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Precipitation record

	Act.	Norm	Dep
North Central District			
Sep-May	9.16	11.59	-2.43
Jan-May	6.37	6.50	-0.13
Apr-May	4.42	4.14	+0.28
Northeast District			
Sep-May	7.83	14.22	-6.39
Jan-May	6.28	7.85	-1.57
Apr-May	3.69	4.75	-1.06
Central District			
Sep-May	6.81	12.60	-5.79
Jan-May	5.34	7.13	-1.79
Apr-May	2.85	4.49	-1.64
East Central District			
Sep-May	7.66	16.41	-8.75
Jan-May	4.96	8.54	-3.58
Apr-May	2.29	5.20	-2.91
Southwest District			
Sep-May	6.67	9.77	-3.10
Jan-May	4.78	5.91	-1.13
Apr-May	1.94	3.86	-1.92
South Central District			
Sept-May	8.34	12.79	-4.45
Jan-May	6.74	7.12	-0.38
Apr-May	1.85	4.42	-2.57
Southeast District			
Sep-May	8.56	17.07	-8.51
Jan-May	5.57	8.71	-3.14
Apr-May	2.18	5.18	-3.00

Field updates, scouting reports

Gary Hall, Extension educator in Phelps and Gosper counties: During a recent storm, some newly emerged soybeans were blown away. All that remained was the seedling stem. In some areas the field will be replanted. We are still in need of moisture and many producers continue to irrigate. With high winds and warm temperatures the irrigation bills will be increasing. Dryland fields are showing signs of drought stress. Alfalfa fields have uneven growth due mainly to dry conditions.

Keith Jarvi, Integrated Pest Management, Northeast REC, Norfolk: The calls are coming in as we have expected. Early planted soybean fields are experiencing feeding damage to cotyledons and leaves by bean leaf beetles. Normally, soybeans can withstand heavy amounts of feeding damage without needing to be sprayed.

With current prices for insecticides and beans, it would take approximately four to six beetles per plant to justify a treatment. Resist the temptation to throw in an insecticide with your Roundup (if you have Roundup Ready beans) just because it is convenient. Save some money and use economic thresholds to determine when treatment is most cost effective. Refer to the April 21 *Crop Watch* for treatment thresholds.

Jim Peterson, Extension educator in Washington County: Most crops here are planted and up. Spotty rains of up to two inches throughout the county provided much needed relief for some producers. Others only received .10 to .20 of rain which did not help much. There have been reports of cutworm activity in southern Washington County as well as many complaints about herbicide drift. Despite the lack of rainfall in some parts of the county, crops do not look that bad at this time.

Ray Weed, Extension educator in Kimball and Banner counties: We have had a good rate of corn emergence and establishment because of adequate soil moisture and warm soil temperatures. Unfortunately, several hundred acres of sugarbeets had to be replanted earlier this month because of hail damage. Sunflowers planting is beginning.

Winter wheat condition varies tremendously across the counties. Some fields have really shown the affects of WSMV the last 10 days or so. Fields at higher elevations have also been stressed and damaged by the freeze here May 13-14.

Ron Seymour, Extension educator in Adams County: Rain was received throughout much of Adams County. These rains have soaked the top 2 inches the soil but it is extremely dry below the upper level. Most of the irrigated field com is in the two to three leaf stages. Most of the soybeans have been planted and a number of fields have emerged. Some of the fields, particularly the earliest emerging ones, had bean leaf beetle damage. Many of the wheat fields have headed out. In some fields, the flag and upper leaves are yellow and brown at the tips as a result of drought stress. In many alfalfa fields, 10-20% of the plants were blooming. Alfalfa weevil feeding damage was noticed but was not severe.

Paul C Hay, Extension educator in Gage County: The dry weather continues to take a toll in Southeast Nebraska. The first cutting of alfalfa on dryland was a third of last year

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Drought *(Continued from page 89)*

rivers are running at 5-15% of historical flow rates in this region.

The Natural Resources and Conservation Service (NRCS) conducted soil moisture tests at 16 locations across the state May 8-12 (*see table, below*). These tests indicated that at 20 and 40 inches, nine of the sites had soil moisture levels below the wilting point. Of the remaining six sites, soil moisture was above the wilting point, but significantly below field capacity.

While the NRCS data was taken before the recent rains, we believe most locations failed to get recharge penetration down to 20 inches.

Planting progress and crop emergence is well ahead of schedule this year. Ninety-eight percent of the corn has been planted, with 85% of the crop emerged. This compares to the five-year average of 84% planted and 43% emerged. Soybeans are 82% planted and 44% emerged, compared to the five-year average of 35% planted and 7% emerged. Even sorghum is ahead of schedule with 56% planted and 16% emerged, compared to the five-year average of 24% planted and 0% emerged.

With emergence ahead of schedule, crop development is also running ahead of schedule. This means that crops will demand greater quantities of water earlier than expected. Most of the crop is in the late two-leaf to mid four-leaf stage. Evapotranspiration rates will rapidly increase during the next few weeks and crop water demands should approach 0.25 inches per day by June 10.

On average, most locations have less than 3 inches of available moisture. With crops already 7-10 days ahead of the five-year average and temperatures averaging 5°F above normal, this limited moisture will probably be used in the next two weeks. Unless significant moisture falls across southeast and east central Nebraska during this period, significant crop stress is likely.

Moisture stress for dryland crops is likely to be an ongoing factor in the 2000 production season. Crop rooting depths will be limited due to insufficient soil moisture below 20 inches and any moisture that does fall will be extracted more quickly from a smaller root zone.

The seriousness of the current situation has prompted governor Mike Johanns to write Dan Glickman, U.S. Secretary of Agriculture, about providing some fast-track assistance at the national level, if it becomes necessary. The first step would likely be the release of CRP acreage for grazing and haying. The state is still trying to sort out the best way to appease wildlife interests, alfalfa producers, and producers short of quality forage. Instead of releasing entire CRP blocks, forage may be limited to a percentage of qualifying CRP land blocks.

The 2000 production season will be a challenging one, to say the least. If long-lead models continue their accuracy, Nebraska can expect to receive above normal temperatures and below normal precipitation throughout the growing season. These models do offer a ray of hope for next year with a return to above normal precipitation.

Al Dutcher
State Climatologist

Soil moisture levels at the 4-, 10-, 20- and 40-inch depths, as recorded by Natural Resource Conservation Service staff May 8-12.

	Percent soil moisture											
	4 inches			10 inches			20 inches			40 inches		
Location	FC	**Sample**	WP	FC	**Sample**	WP	FC	**Sample**	WP	FC	**Sample**	WP
Ainsworth	26	11.8	11.1	27.8	**8.4**	15.8	17	**3.4**	6.9	14.2	**3.1**	6.9
Alliance	16.6	9.9	4.3	16.6	11.2	4.3	16.8	8.6	4.3	16.6	7.3	4.3
Arthur County	16.6	4.5	4.3	16.6	5.7	4.3	16.6	5.7	4.3	16.6	6.4	4.3
Beatrice	27.8	**7.5**	15.8	30.5	**8.5**	20.2	30.5	**14.4**	20.2	27.8	**11.6**	15.8
Concord	27.8	22.1	11.1	27.8	18.8	11.1	27.8	**9.3**	15.8	26	**8.3**	11.1
Elgin	17	**3.6**	6.9	17	**3.3**	6.9	17	**2.3**	6.9	17	**3.1**	6.9
Gudmundsen	11.8	11.7	2.6	11.8	9.5	2.6	11.8	7.8	2.6	8.1	8.1	3.9
Holdrege	26	18.6	11.1	27.8	16.3	15.8	27.8	18.9	15.8	26	14.7	11.1
McCook	26	17.5	11.1	26	19.3	11.1	26	11.4	11.1	26	**9.1**	11.1
Mead	26	16.7	11.1	26	14.1	11.1	27.8	**12.6**	15.8	27.8	**9.8**	15.2
Scotts Bluff Cnty	14.2	7.3	6.9	14.2	15.2	6.9	14.2	9.9	6.9	9.5	**4.5**	4.8
O'Neill	11.6	**5.8**	6.4	11.6	**5.6**	6.4	11.6	**3.6**	3.9	8.9	4.2	3.9
Ord	26	**8.5**	11.1	27.8	**7.5**	15.8	30.5	**6.6**	20.2	14.2	**5.4**	6.9
Pawnee	27.8	**15.7**	15.8	30.5	**17.2**	20.2	30.5	**15.9**	20.2	27.8	19.5	15.8
West Point	27.8	17	15.8	27.8	17.2	15.8	27.8	**12.7**	15.6	27.8	**13.3**	15.8
York	26	17.6	11.1	26	16.2	11.1	26	18.7	11.1	26	18.3	11.1

FC = field capacity; WP = wilting point. Shaded areas = samples with soil moisture below the wilting point. The field capacity and wilting point of the soils were determined by comparing soil textures at the sites with known soil textures and their average soil moisture percent for field capacity and wilting points as determined by the National Soil Survey Laboratory, NRCS, Lincoln.

Scout for corn rootworms after egg hatch

Rootworm egg hatch could begin before the end of May in southeastern and southcentral Nebraska, given the above normal degree-day accumulations this year. Hatch will occur somewhat later in northeastern Nebraska and the western half of the state.

Initial hatch is very hard to detect in the field, as newly hatched rootworms are very small.

One method to detect hatch is to dig up corn plants, carefully shake off soil from roots and put roots over a coffee can containing water. A coarse wire screen platform can be placed over the top of the can to hold corn roots. As the root dries out rootworm larvae will fall out and drop into the water where they can be more easily seen.

After hatch occurs you should begin to scout continuous corn fields for corn rootworm larvae and damage, regardless of whether a soil insecticide was applied at planting. This will help determine whether an insecticide is needed, if one was not used at planting, and provide a check of the effectiveness of planting time insecticide applications. In case of poor control, this will allow you to apply a rescue treatment before too much damage has occurred.

To check for larvae in a field, dig a 7-inch cube of soil centered on the corn plant. Sample a minimum of two plants at each of five sites in a field. Carefully search through the soil and plant roots for larvae. There are three larval stars (stages). The greatest amount of damage is done in the last stage. Degree-day accumulations needed to complete development of different stages are shown in the table. The first instars are about 1/16 inch long and difficult to find without magnification. Often the first detected rootworms are second instars. Corn rootworm larvae are slender, cream-colored, with brown heads and a dark plate on the top side of the tail, giving them a double headed appearance. Mature larvae are 1/2 inch long. Searching through the soil and roots may be done over a sheet of black plastic to help you see the small white worms. There is no established treatment guideline for corn rootworm larvae, but some consultants advise treating if there are two or three rootworms per plant. The usefulness of this guideline is dependent on your ability to find rootworm larvae in the soil.

Cultivation time treatments of insecticides, if needed, should be applied soon after egg hatch begins. Cultivation time applications of insecticides are an effective means of reducing injury to com plants from rootworm feeding damage. Most planting-time granular soil insecticides (except for Aztec and Fortress) labelled for corn rootworms are also labelled for use at cultivation. Incorporate granules with 1-2 inches of soil after application; effectiveness may be decreased unless the insecticide is incorporated.

Other options include the use of Furadan 4F and the use of chemigation treatments with Lorsban 4E. Control with Furadan 4F generally will be improved if the treatment is cultivated into the soil, unless sufficient rainfall occurs after application to move the insecticide down into the root zone. Lorsban 4E applications should be timed for the first appearance of second instar corn rootworms. Additional information on suggested insecticides, rates and restrictions is available at *http://www.ianr.unl.edu/ianr/ entomol/instabls/crwlarv1.htm*

Bob Wright
Extension Entomologist
South Central REC

ECB moth flight

European corn borer moth flight began across eastern Nebraska last week. Light trap data from University of Nebraska sites can be accessed at:

http://www.ianr.unl.edu/ianr/entomol/fldcrops/fldcrops.htm

Bob Wright, Extension Entomologist, South Central REC

Duration of immature stages of western corn rootworm at constant temperatures

	Days to complete stage (male/female) at different constant temperatures (F)			*Degree days to complete stage (48.2°F base)*	
Stage	**64.4**	**69.8**	**75.2**	**Males**	**Females**
1st instar larva	8.1/8.6	5.6/6.2	4.8/5.3	70.4	77.7
2nd instar larva	6.8/7.1	4.9/5.4	4.3/4.9	61.7	70.6
3rd instar larva	15.0/15.5	11.2/11.9	9.4/10.4	140.5	149.2
Pupa	13.5/13.8	10.1/10.1	7.8/8.4	122.2	125.1
Hatch to adult emergence	43.4/45.0	31.8/33.6	26.3/28.9	394.8	422.6

Source: Jackson & Elliot, 1988, Environmental Entomology 17:166-171.

Herbicide replant options

Following several recent storms, some producers are looking at replant options for corn. This early in the season, replanting to corn is still a good option; however, as we move into June, corn becomes less of an option, forcing producers to replant to other crops. Many preemergence herbicides restrict replant options so before deciding what to do be sure to check product labels.

One method of planting into soil containing damaging herbicide residues is to set furrow openers on the planter to remove the surface soil. A heavy rain after planting would negate this technique and may result in the crop being "silted under." Use herbicides only "as needed" on the replant crop.

A sound strategy is to consider potential replant options when choosing a herbicide for a given site. Understanding that herbicide choice with respect to replant options is not always possible, the following table lists planting options based on our judgment for various herbicides with the time delay required between application and planting. These estimates can be influenced by several factors including application rate, soil organic matter content, and pH. Always read and follow the herbicide label.

Jeff Rawlinson
Extension Weed Science
Alex Martin
Extension Weed Specialist

Replant options

Herbicide	Replant Crops	Time Delay
Accent	Corn	None
Accent Gold	Corn	None
Aim	Corn	None
Atrazine	Corn, sorghum	None
Authority	Soybeans	None
Axiom	Corn, soybean	None
Axiom AT	Corn	None
Balance	Corn	None
Banvel	Corn, sorghum	15-30 days
Basis Gold	Corn	None
Bicep Magnum TR	Corn	None
Beacon	Corn	None
Bicep/Bicep Lite	Corn, sorghum (safened seed)	None
Bladex	Corn	None
	Sorghum, soybeans	15-30 days
Broadstrike + Dual	Corn, soybeans	None
Broadstrike + Treflan	Soybeans	None
Buctril/Atrazine	Corn, sorghum	None
Bullet	Corn, sorghum (safened seed)	None
Canopy	Soybeans	None
Canopy XL	Soybeans	None
Celebrity	Corn	7 days
Celebrity Plus	Corn	7 days
Clarity	Corn, sorghum	15-30 days
	Soybeans	1/2 pt-14 days after 1 inch rain
Command	Soybeans	None
Connect	Corn, sorghum	None
Cycle	Corn	None
	Sorghum (safened seed)	0-15 days
Dual/Dual II	Corn, sorghum (safened seed)	None
	Soybeans	None
Distinct	Corn	7 days
DoublePlay	Sorghum	30 days
EPIC	Corn	None
Eradicane	Corn	None
	Sorghum	30 days
	Soybeans	10-15 days
Exceed	Corn	None
Extrazine II	Corn	None
	Sorghum	15-30 days (depends on rate)
Field Master	Corn, sorghum (safened seed)	None
Frontier	Corn, soybeans	None
	Sorghum (safened seed)	None
FirstRate	Soybeans	None
Guardsman	Corn, sorghum (safened seed)	None
Harness Plus	Corn, soybeans, sorghum (safened seed)	None
Harness Xtra	Corn, sorghum (safened seed)	None
Hornet	Corn	None
Laddok	Corn, sorghum	None
Lasso	Corn, sorghum (safened seed)	None
	Soybeans	None
Lariat	Corn, sorghum (safened seed)	None
LeadOff	Corn, sorghum (safened seed)	None
Liberty	Corn, sorghum, soybeans	None
Liberty ATZ	Corn, sorghum	None

Southeast wheat tour

An NU wheat plot tour will be 6 p.m. June 6 at Verle Schoenrock's farm in Jefferson County, 3 miles west of Fairbury at 564th Avenue, then 1 mile north to 713 Road, then 1/2 mile west, on south side of the road. For more information contact Paul Hay, Extension educator in Gage County, at (402) 223-1384.

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Replant options (Continued from page 93)

Herbicide	Replant Crops	Time Delay
Lightning	IMI Corn	None
Marksman	Corn	None
	Sorghum	30 days
Matador	Corn, soybeans	None
Micro-Tech	Corn, soybeans	None
	Sorghum (safened seed)	None
Paramount	Wheat, sorghum	None
Peak	Corn, sorghum	None
Poast Plus	PP Corn, soybeans	None
Princep	Corn only	None
Prowl	Soybeans, sunflowers	None
Pursuit	Corn (IR, IT), soybeans	None
Pursuit Plus	Soybeans	None
Python	Corn, soybeans	None
2,4-D	Corn	3-7 days
	Sorghum	10-30 days
	Soybeans	7-30 days
Ramrod	Corn, sorghum, soybeans	None
Ramrod/Atrazine	Corn, sorghum	None
Raptor	Soybeans	None
Roundup Ultra	Corn, sorghum, soybeans	None
Scepter	Corn (IMI), soybeans	None
Scorpion III	Corn	None
Skirmish	Soybeans	None
Spirit	IR, IMR corn	None
	Conventional corn	4 weeks
Steel	Soybeans	None
Sutan	Corn	None
	Sorghum	30 days
	Soybeans	10-15 days
Surpass	Corn, soybeans,	None
	Sorghum (safened seed)	None
Surpass 100	Corn, sorghum (safened seed)	None
Sutazine	Corn	None
	Sorghum	30 days
Topnotch	Corn, soybeans	None
	Sorghum (safened seed)	None
Tough	Corn, sorghum	None
	Soybeans	30 days
Treflan	Soybeans	None

Late cutting alfalfa

Alfalfa has matured much faster than usual this spring. For many growers, despite the best of intentions, alfalfa is going to be more mature than planned at first cutting.

At this point, raising the cutting height may be a wise management change. Normally it's best to leave as short a stubble as possible because that maximizes yield and doesn't affect rate of regrowth; however, late cutting is different.

Before cutting, walk into your alfalfa field and closely examine the base or crown of plants. Are short, new shoots starting to grow? These are the new plants for the second cutting. Are many of these shoots two or three inches taller than your usual stubble height? If you cut them off along with the first growth, your alfalfa plants will have to start a whole new set of shoots for regrowth. This could delay regrowth for the second cutting by as much as two weeks.

To avoid this delay, raise your cutting height a couple inches to avoid cutting most of these new shoots. Plus, the stubble you leave behind has quite low feed value anyway, so the yield you temporarily sacrifice is mostly just filler.

Bruce Anderson
Extension Forage Specialist

Field updates (Continued from page 90)

and most fields have gone into dormancy. There is evidence of sterile florets on the wheat which came up in February and the expected yield level has fallen to 15 bushels per acre or below. I estimate that 15,000 acres or about 30% of the crop will be harvested for forage. The corn, milo, and soybeans are okay now, but rain will have to come within the week or losses will start to mount.

Noel Mues, Extension educator in Furnas County: Most of the corn has emerged and soybean planting is nearly complete. We planted the soybean variety plot on May 17. The top 1.0- 1.5 inches of soil was very dry and the beans will have to be irrigated to insure germination. We've received about 1.5 inches of rain in April and about 0.25 inch in May. All crops, pastures and rangeland are desperately needing rain. Some greenbug and aphid infestations have been reported in the wheat.

Terry Gompert, Extension educator in Knox County: A county wide rain of 2 to 5 inches lifted spirits. The effective rainfall was probably nearer 1.5 inches since the event came fast. Soil erosion was common on unprotected soils.

Alfalfa weevils continue to devour alfalfa and there has been much early harvesting and spraying. Flea beetles have been reported in corn, but numbers are not too heavy Corn and soybeans are quickly emerging, as are weeds.

Barley yellow dwarf in oats and wheat

We are seeing typical barley yellow dwarf symptoms in both wheat and oats in eastern Nebraska. Kansas has been reporting a moderate level of barley yellow dwarf in their wheat for the last month. We noted symptoms in the wheat plots at Lincoln in early May and recently have been receiving occasional reports of the red leaf symptom in oats.

Barley yellow dwarf is diagnosed in the field when plants appear yellowish to reddish. The plants may be grouped or in a small patch that represent patterns of aphid feeding since this virus is aphid transmitted.

Oats: Symptoms vary according to the oat variety the virus strain, the growth stage of the plant at the time of infection, and the general health of the plant. The main color change is to shades of yellow, reddish-orange, reddish-brown, or purple.

The first symptoms of infection are yellowish-green spots or blotches near the tips of older leaves. Eventually these blotches enlarge and coalesce, turning various shades of yellow, red and brown. The entire leaf ultimately becomes a reddish-orange to brown or purple. Severely infected plants are shorter, produce lower test weight grain, and have more blasted florets.

Wheat: If winter wheat is infected in the fall, yellowing of leaves usually does not occur until mid-spring. In severe fall infections, some stunting and reduced tillering may develop. Barley yellow dwarf symptoms start to become obvious at about the jointing stage of growth.

Barely yellow dwarf virus does not produce a distinct mosaic pattern, as do wheat streak mosaic virus or soil-borne wheat mosaic virus. The pattern of symptom expression is similar to that in barley or oats.

Leaf symptoms begin as blotches near the tip, and with time these turn various shades of yellow, red or purple. Progression of symptoms is from leaf tip to base and margin to mid-rib. Symptoms are more pronounced under cool temperatures, causing the tips of flag leaves to sometimes become a reddish-purple.

The yellowing in wheat is not as brilliant as it is in barley, and the reddening of leaves is not as pronounced as it is in oats. In wheat, the pale yellowing of older leaves is the more typical symptom. The extent of yellowing, stunting and yield reduction is contingent on whether the plant is infected as a seedling or during post-seedling development. Leaves of some cultivars under some conditions remain green, but plants become stunted.

In the field, barley yellow dwarf first appears in small localized patches that increase in size as more and more infected plants show symptoms. Generally the plants in the center of these patches show more severe symptoms, with the symptom intensity decreasing toward the perimeter.

Early planted winter wheat and winter barley, late planted spring oats, and spring barley are the most susceptible to infection. Younger plants are more attractive to aphids than older plants. Planting winter cereals should be delayed until aphid populations decline to minimize barley yellow dwarf outbreaks. Proper seeding date allows the plants to develop when aphid populations are lowest.

Although early seeding of spring cereals does not give full protection against barley yellow dwarf, it allows plants time to develop past the seedling stage before they might become infected. This delay significantly reduces damage to the crown.

The more tolerant oat varieties such as Blaze, Chaps, Don, Gem, Horico, Jim, Jud, Larry, Ogle, Prarie, Rodeo, Settler and Troy will show subdued symptom expression compared to the susceptible varieties such as Garry, Rodney and Russell.

Insecticidal control of aphids in the fall may reduce the incidence of barley yellow dwarf infections; but if aphids escape the treatments or migrate in from untreated areas, insecticides are of little use except in reducing secondary spread within the field.

Insecticide treatment of spring cereals to control barley yellow dwarf rarely is justified. For insecticides to be effective, application needs to be timed to coincide with the migration of aphids into the field. This is difficult because there is not an adequate system of forecasting migration of cereal aphids in North America.

John E. Watkins
Extension Plant Pathologist

Check alfalfa for spring black stem

While the dry conditions have held back most foliar fungal diseases, spring black stem could still be a problem in some irrigated alfalfa. Spring black stem is a fungal disease whose peak period is in May when cool, wet conditions occur. The disease occurs on leaves, petioles and stems and can contribute to crown and root rot.

Symptoms include small black spots on leaves, petioles and stems of new shoots. Leaf lesions caused by spring black stem are irregular in shape compared to common leaf spot, which will be circular and small. Stem lesions will enlarge until most of the stem is black and girdled stems will die. The fungus also infects the crown and upper taproot leading to stand thinning and overall decline.

Spring black stem is normally not a problem after the first cutting. The best management option for this disease is to adjust the cutting schedule and harvest diseased fields early to reduce defoliation and maintain forage quality

Loren J. Giesler
Extension Plant Pathologist

Model indicates how early soybean planting dates affect development

How does early planting affect soybean crop development? Normally this is not much of a concern, but with good field conditions this spring some farmers finished their corn planting early and decided to plant their soybeans. There also has been discussion about very early soybean planting — dates before April 15. We don't have a lot of experience with very early planting, so this may be a good year to see how development is affected by planting dates and conditions.

2000 crop development modeled

The table contains projected dates of soybean development for a Group III variety planted at 10-day intervals starting March 1 near Fairmont. The dates were calculated on May 22 using measured weather data up to May 21, forecast weather through May 28, and long-term average weather data for the remainder of the year. The calculations are based on the day length and temperature relationships in SOYGRO and PCYield software developed by J. Jones and his collaborators. Weather data was provided by mPower[3] (*http://www.mpower3.com/*).

A 10-day delay in planting between May 20 and May 30 gives a projected 9-day delay in maturity. With earlier plantings, the influence of planting date on maturity is reduced: There is only a one-day difference in maturity projected for a March 11 versus a March 31 planting. The time needed for seedlings to emerge plays a big role in crop response to planting date. Cold soil can slow down emergence considerably (for example, four days when planted on May 20 versus 27 days when planted on March 1). Delays in flowering also tend to make maturity date less variable. Temperature is the key: crops planted early experience cooler temperatures, which lengthens the period from planting to flowering. In the example shown in Table 1, the length of time from flowering to maturity is approximately the same for all the planting dates.

Soybean is a "short day" plant. Research in growth chambers shows that soybean develops faster in short days, like those of early spring, and slower in the long days at the start of summer (see *Fig. 1*). You may have noticed that beans under a street light or by a road sign stay green longer in the fall. The lights make the plant believe days are longer than they really are, and crop development is slowed. In the field, away from the lights, temperature is the practical concern, not daylength. Even though days are shorter in

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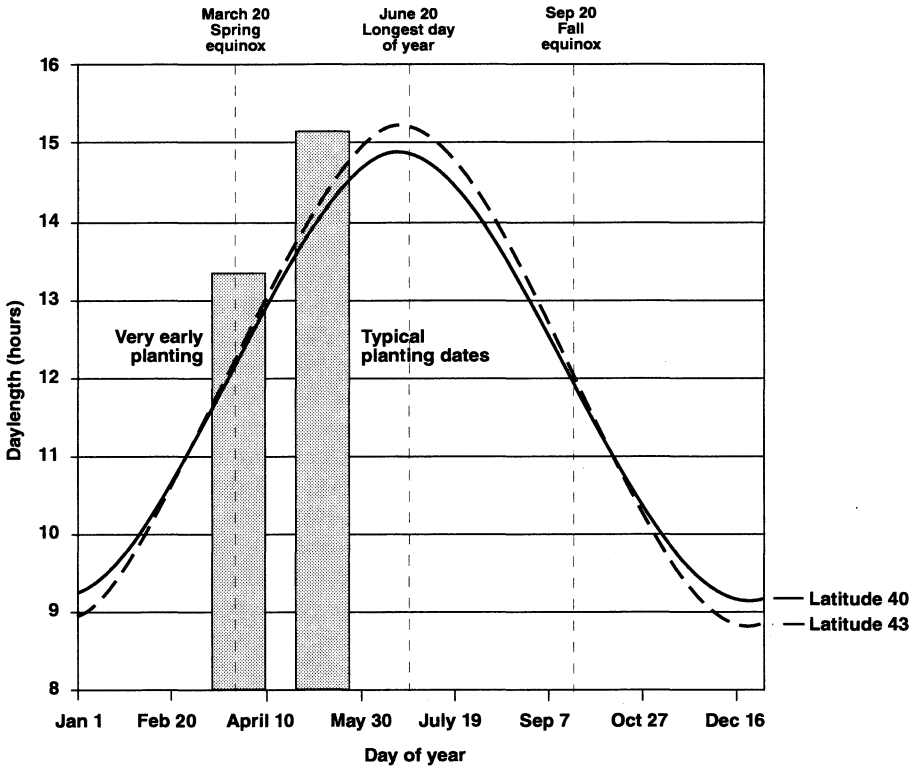
Table 1. Estimated soybean development for a Group III variety, 10 planting dates near Fairmont 2000.

Planting date	Mar 1	Mar 11	Mar 21	Mar 31	Apr 10	Apr 20	Apr 30	May 10	May 20	May 30
Emergence	Mar 28	Apr 9	Apr 10	Apr 18	Apr 23	Apr 29	May 6	May 16	May 24	June 4
V-stage 1	Freeze	Apr 13	Apr 14	Apr 21	Apr 26	May 2	May 7	May 17	May 26	June 5
End of juvenile phase		Apr 18	Apr 19	Apr 24	Apr 29	May 4	May 10	May 20	May 28	June 7
Flower induction		May 7	May 7	May 10	May 14	May 17	May 24	May 31	Jun 8	June 18
R1: first flower		May 29	May 29	May 31	Jun 3	Jun 6	Jun 11	Jun 17	Jun 24	July 3
First pod set		Jun 6	Jun 6	Jun 8	Jun 11	Jun 14	Jun 18	Jun 24	July 1	July 10
End of leaf area development		Jun 7	Jun 7	Jun 9	Jun 12	Jun 15	Jun 19	Jun 24	Jun 29	July 6
R4: Pod at one of top 4 nodes		Jun 12	Jun 12	Jun 13	Jun 16	Jun 19	Jun 24	Jun 29	July 6	July 15
Last pod formed		July 6	July 6	July 8	Jul 10	Jul 13	Jul 18	Jul 23	Jul 30	Aug 8
R7: Physiological maturity		July 16	July 16	July 17	July 20	July 23	July 27	Aug. 1	Aug 8	Aug 17
R8: Harvest maturity		Aug 2	Aug 2	Aug 3	Aug 6	Aug 9	Aug 13	Aug 18	Aug 25	Sept. 3

Early planting *(Continued from page 96)*



Daylengths in Nebraska, from latitude 40 (the southern boundary) to latitude 43 (the northern boundary). Note that daylength is at a minimum at the start of winter, at a maximum at the start of summer, and is 12 hours at the spring and fall equinoxes.

March and April than in May (*Fig. 1*), cooler temperatures increase the number of calendar days between planting and flowering for the very early plantings. There can be a juvenile phase, starting at emergence, in which the plants wait before sensing daylength, but the juvenile phase is probably short or non-existent in varieties adapted to Nebraska. The table gives estimates for the date of flower induction — the time buds start their development into flowers. Flower induction is a hidden step because it happens chemically inside the cells. The speed of development from flower induction to flowering depends on growing degree days. Cooler weather will lengthen the period.

Weather plays a big role in the success of an early planting date. The chance of a freeze is low now, which is good news for those who planted early. Soil temperatures are warmer than average so beans should be germinating and emerging faster than last year. Farmers who planted their soybeans early are encouraged to observe and record crop growth stages this season. Watch for the date the first flowers appear and count the number of fully expanded leaves on the plant. Also note when pods and seed first form at the top four nodes of the plant. These observations will help you understand how well the development of the crop matches your particular environment.

For further information on soybean development, see: *http://www.oznet.ksu.edu/_library/crps12/samplers/c449.htm* or *http://hancock134.exnet.iastate.eud/agriculture/soybean/bean_develop/.*

Robert Caldwell, Extension Croping Systems Specialist

Corn insect book offers I.D., injury, development info

The Entomological Society of America has published several insect handbooks which would be of use to producers and consultants.

The Handbook of Corn Insects provides growers and the experts that they rely upon with comprehensive information on preventing, detecting, and controlling insect pests in corn. With contributions from 37 entomologists who are experts in corn Insect pests, the handbook includes the latest techniques in corn pest management. It also features color photos of insects and insect injury, distribution maps, illustrated growth charts, a glossary sources of local information, and an important section on biological control. The book is 164 pages.

Other publications in the series are: The Handbook of Soybean Insect Pests, The Handbook of Turfgrass Insect Pests, and The Handbook of Household and Structural Insect Pests.

Cost is $35 for 1-4 copies, $24 each for 5-25 copies; $21 each for 26-50 copies; and $18 for 50+ copies. Shipping and handling is $5 for the first item and $1 for each additional item.

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Field tests underway

Polymer seed coating delays germination

Imagine planting early spring, or even late fall, into cold soil and having the seeds lie there until the weather warms up later in the spring. Then the crop germinates and starts growing like it had just been planted. Though not yet on the market, that's the idea behind an exclusive new polymer seed coating being developed by Intellicoat™ Corporation of Menlo Park, California. The polymer coating prevents the seed from absorbing water when the temperature is cold enough to cause biological damage to the seed.

The coating, a fatty acid polymer made from corn and soybean oils, takes about 250 to 300 heat units to activate and allow water to penetrate the coating for absorption by the seed, according to Claude Butt, senior agronomist for Intellicoat. This delays germination by about 14 to 18 days when used in early May or about 35 to 60 days if planted in early March. However, with the warm March experienced this spring, that delay would have only been a couple of weeks. Any treated seeds would have germinated, emerged, and been susceptible to frost.

The breakdown of the polymer coating is heat unit related, not triggered directly by temperature. A series of warm days could lead to the accumulation of heat units, allowing moisture to penetrate the coating, even if the temperature wasn't high enough for germination. The porosity change of the polymer is slightly reversible if the coating starts warming and then cools back down; however, enough moisture may have entered the seed that its viability may be affected, so planting in the fall or very early spring will not be recommended.

Farther north in Canada, where the spring warmup is later and fairly quick, the polymer coating is being used on fall seeded canola, continues Butt. That far north, they have seen the potential for successful fall seeding and spreading the planting workload. But in the Midwest, there are too many warm days in February and March to consider fall seeding. For now, Intellicoat is focusing on relay cropping soybeans with wheat, planting coated soybeans into growing wheat about the first week of May before the wheat is heading. With the delayed emergence, the soybeans are then growing when the wheat is harvested, allowing double cropping to move northward into the central and northern Corn Belt.

Fielder's Choice Direct™, an Indiana-based seed company owned by Intellicoat, has on-farm relay cropping research on about 900 acres with 40 cooperators in seven Midwest states, with one site in Nebraska west of North Platte, Butt said. Most of these cooperators are using a system based on 15 inch row spacing to allow room for interseeding soybeans into the growing wheat. With the higher rainfall of the eastern Corn Belt or with irrigation in the western Corn Belt, this would allow two crops in one year. (See *www.relaycrop.com* for more information.)

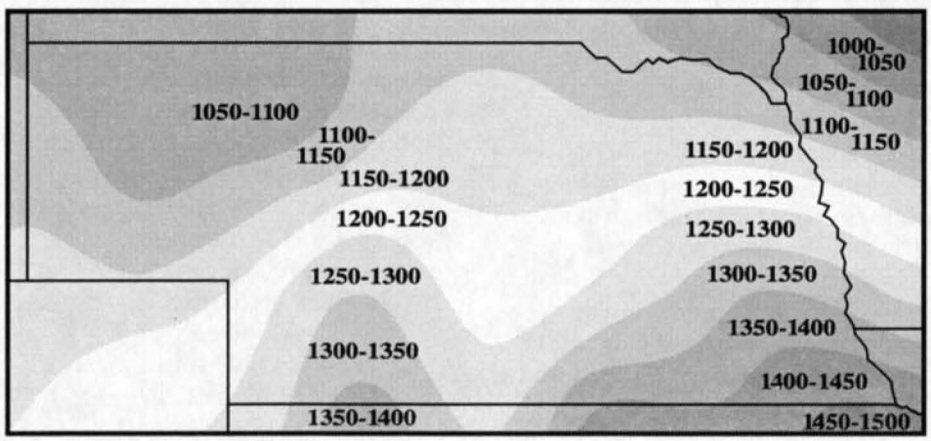
Butt reported that the Intellicoat Corporation was surprised at the interest producers had in using the polymer coating for early planting of both soybeans and corn to spread the planting workload. They have a couple of university trials this year and hope to do on-farm research next year. A coating may be available spring 2002 for several crops. They are experimenting with different additives to the coating, exploring options such as Rival and Vitavax for disease protection on soybeans and nutrients on corn.

About 15 to 20 seed corn companies are trying an Intellicoat coating this year on male inbreds used in seed production. This allows seedcorn producers to plant both the male and female inbreds at the same time, saving atrip across the field and guaranteeing that the male rows get planted in a timely manner. The coating delays the germination and emergence of the male rows to match pollination to silking. By varying the thickness of the polymer coating or by mixing with some uncoated seed, the pollination period can be extended.

The polymer seed coating has to be uniform on all sides of the seed to provide predictable and reliable delays in germination. Treatment involves spraying on the coating in a seed tumbler and using low heat drying.

The price of the seed coating has not been determined. Producers will have to balance the cost with the agronomic and machinery management benefits of an extended planting season.

Paul Jasa
Extension Engineer



Common stalk borers *(accumulated Jan. 1-May 22)*

Producers should begin scouting corn for common stalk borers when 1,300-1,400 growing degree days have accumulated,using a 41 F base.